

Minnesota Wolf Management Plan

Prepared by the

Minnesota Department of Natural Resources

Section of Wildlife

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Executive Summary

The goal of this management plan is to ensure the long-term survival of wolves in Minnesota while addressing wolf-human conflicts that inevitably result when wolves and people live in the same vicinity. This plan was developed by holding 12 public information meetings throughout the state in January 1998, convening a wolf management roundtable (Roundtable) that held 8 days of meetings to develop consensus recommendations, and utilizing the wealth of biological, sociological, cultural, and economic data, reports, and experience available to the Minnesota Department of Natural Resources (DNR).

The ecology of wolves and their relationships to humans have been more studied in Minnesota than anywhere else in the world. We know much about their distribution, numbers, prey relationships, social organization, reproduction, and survival. In general, wolf numbers are highest where prey is abundant and human-caused mortality is low. We also know that humans hold a wide range of values related to wolves. During the past 30 years, legal protection of wolves and management for a healthy prey base have contributed to a threefold increase in wolf numbers in Minnesota. Wolves have been protected under Federal endangered species laws since 1974, and primary management authority since that time has resided with the United States Fish and Wildlife Service (USFWS). With wolf numbers quickly increasing in Wisconsin and Michigan in recent years, the wolf in the western Great Lakes region now meets established criteria for removal from the federal listing of threatened and endangered species.

When management authority reverts to the states, DNR, in cooperation with the Minnesota Department of Agriculture (MND) and the United States Department of Agriculture (USDA) Wildlife Services, proposes to keep in place some current wolf management activities, and to enhance or add others.

DNR will conduct, facilitate, or recommend to the Minnesota Legislature the following management activities:

Population Monitoring

- employ and enhance the currently used methodologies to assess wolf population numbers, distribution and demography
- encourage and conduct telemetry monitoring of wolves in selected areas
- monitor aspects of wolf health and diseases

Population Management

- wolf populations in Minnesota will be allowed to continue to expand, with a minimum population goal of 1,600
- no general public taking of wolves will be proposed for the first 5 years of implementation of this plan

- killing of depredating wolves will be limited to areas where conflicts with humans, livestock, or dogs occur

Public Safety

- harassment of wolves to discourage contact with humans will be allowed
- killing of wolves in defense of human life will continue to be allowed

Wolf Damage Management

An integrated wildlife damage management program that combines animal husbandry considerations, nonlethal deterrents, lethal wolf removal, and compensation payments to owners of livestock and dogs will be proposed, including the following activities:

- the current USDA Wildlife Services wolf damage control program will be continued, under a new cooperative agreement
- a handbook for wolf depredation investigations will be produced, and all certified investigating agents will be trained
- a central public telephone contact for wolf depredation assistance will be created
- a database of all reported depredation losses will be created
- the use of Best Management Practices (BMPs) by livestock owners will be encouraged (see page 21)
- the harassment of wolves will be allowed under certain conditions, to discourage interaction between wolves and humans, livestock, or pets
- lethal control of wolves by state contract trappers may be conducted under certain conditions
- any person may kill wolves in defense of human life
- owners of livestock, livestock guard animals, and dogs may kill wolves that pose an immediate threat to their animals, under certain conditions
- compensation for livestock losses will be increased
- compensation will be proposed for losses of dogs and livestock guard animals
- compensation will be proposed for veterinary costs resulting from wolf depredation
- a legislative appropriation to match non-public funding sources for projects of ongoing research, development, and dissemination of BMPs and nonlethal means of wolf control will be proposed

Habitat management

- Wolf habitat components, including wolf prey (deer and moose) and the vegetation and other environmental variables they depend upon; human-caused wolf mortality; and connectivity of wolf populations will be monitored and managed

Enforcement

- gross misdemeanor penalties for illegal wolf taking will be created
- a restitution value for illegally taken wolves will be established at \$2,000
- the release of captive wolves and wolf-dog hybrids will be prohibited

- activities necessary to enforce wolf laws and regulations will be initiated and increased

Information and education

- timely and accurate information about wolves and wolf management will be available to the public in written, visual, and electronic formats
- wolf education programs and activities conducted by private organizations will be supported and facilitated
- timely news releases about wolves and wolf management will be prepared
- responsible wolf ecotourism will be encouraged as an important form of public education
- periodic knowledge and attitude surveys (5 years) of Minnesota citizens living both inside and outside wolf range will be conducted, because public attitudes directly impact wolf management

Research

- wolf research will be encouraged, coordinated, supported, and initiated when necessary
- primary research topics will include wolf population assessment, wolf-livestock interactions, and wolf-prey interactions

Public involvement

- all groups participating in the 1998 Roundtable (and others) will be invited to meet and review wolf management plan implementation and progress each year for the five years following Federal delisting of the wolf

Staffing

- a wolf specialist position will be created, to provide overall coordination of wolf management activities
- a wolf research biologist position will be created, to coordinate and conduct wolf research and population monitoring
- three conservation officer positions will be created, to ensure that wolf laws and regulations are enforced, and depredation responsibilities are handled in a timely manner

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INTRODUCTION

Since the eastern subspecies of the timber wolf, *Canis lupus*, (now referred to as the gray wolf, and in this plan, simply “wolf”) was given full protection in 1974 by the Endangered Species Act of 1973 (ESA), the federal government and states in the western Great Lakes region have managed wolves with the primary objectives of enhancing populations in Minnesota and re-establishing viable populations in Wisconsin and Michigan. The ultimate goal of such management was to exceed the population guidelines set forth in the 1992 federal Recovery Plan for the Eastern Timber Wolf, and have the subspecies removed from the federal list of endangered and threatened species.

Plan goal

In 1998, the Minnesota Department of Natural Resources (DNR) adopted the following position statement on wolf management goals in Minnesota:

The Minnesota Department of Natural Resources is committed to ensuring the long-term survival of the wolf in Minnesota, and also to resolving conflicts between wolves and humans.

For delisting (the removal of wolves from the federal list) to occur, each state not only needs to demonstrate that the biological requirements of wolf recovery have been met, but also must prepare detailed management plans for wolves that assure their continuing survival. After delisting, most legal responsibility for management will reside with the states.

Plan development

The development of this plan consisted of three main activities.

Public information meetings -- DNR held 12 public information meetings throughout the state in January 1998 to present an overview of the wolf management planning process, to answer questions about wolves and wolf management, and to seek public comments on management issues. Attendees were provided with two informational handouts and encouraged to complete a public comment sheet. An estimated 3,275 people attended the meetings, and about half (1,572) submitted comment sheets at the meetings. Comments were tabulated by meeting place and in aggregate for future use.

Wolf Management Roundtable -- DNR convened a Minnesota wolf management roundtable (Roundtable) composed of representatives of environmental, agricultural,

hunting, trapping, and wolf advocate organizations; government agencies; and private citizens who had specific interest in wolf management issues in Minnesota. The purpose of the Roundtable was to provide guidance to DNR in developing a wolf management plan for Minnesota by deriving consensus recommendations on wolf management plan options, with particular emphasis on the controversial aspects of wolf management. At the first meeting of the Roundtable in April 1998, Commissioner Rod Sando committed DNR to endorsing all Roundtable consensus recommendations, as long as the survival of the wolf in Minnesota would be assured and the recommendations were biologically sound. Seven meetings were held, and the consensus-based decision-making process was facilitated by Roger Williams, Director of the Office of Dispute Resolution of the Minnesota Bureau of Mediation Services. On 28 August 1998, the Roundtable completed deliberations and came to consensus on a wide range of wolf management issues (Appendix I).

Wolf Management Plan -- DNR Section of Wildlife staff drafted this plan, incorporating all Roundtable consensus recommendations. In addition, DNR staff and advisors referred to biological, sociological, and economic data, reports, and experience; and after discussion and consideration, completed the plan that follows.

BIOLOGY AND HISTORY OF WOLVES IN MINNESOTA

General knowledge and research

Worldwide, wolves have been scientifically studied more than any other carnivore species, resulting in a comprehensive understanding of their ecology and relationship to humans. Minnesota's wolves have been the subject of more scientific investigations than any other regional group of wolves, worldwide. The first scientific study of wolves carried out in Minnesota was reported on 60 years ago by Sigurd Olson, and researchers still actively study wolves in a variety of areas of the state today. The result of these efforts has been a voluminous literature that comprises much that we know about wolves and their relationships with the environment and with humans. There are many papers and books that could be individually cited in a review of wolf biology and history in Minnesota, but for clarity and brevity, the following summary has been excerpted from compilations in a few pertinent publications, including a review and estimate of wolf distribution and numbers in Minnesota by Dr. Todd K. Fuller et. al. in 1992, the federal Eastern Timber

Wolf Recovery Plan published in 1978 and revised in 1992, and a set of guidelines for wolf management in the Great Lakes region by Dr. Todd K. Fuller in 1997.

Biology

Distribution and relations with other wolves and carnivores -- Before settlement by Europeans, wolves inhabited all of Minnesota, from the southern prairies to the northern forests. The subspecies formerly known as the eastern timber wolf (*C. l. lycaon*) ranged contiguously throughout southeastern Canada and northern Minnesota, and likely intergraded with wolves formerly known as buffalo wolves (*C. l. nubilus*) along the prairie-forest border to the south and west. To the human inhabitants of the region, all wolves looked and behaved rather similarly, and at present all wolves in Minnesota are considered a single subspecies by scientists. There is genetic evidence that a few wolves bred with coyotes (*Canis latrans*) during the past century when wolf numbers were low and coyotes expanded their range into and through Minnesota, but the biological consequences of such interbreeding cannot be detected. In general, wolves displace coyotes, but are tolerant of red fox.

Prey relationships -- Historically, wolves preyed on large hoofed mammals (ungulates) in Minnesota, such as white-tailed deer (*Odocoileus virginianus*), elk (*Cervus elaphus*), woodland caribou (*Rangifer tarandus*), moose (*Alces alces*), and bison (*Bison bison*) wherever they occurred. Wolves are not habitat specialists; they can live anywhere prey is sufficiently abundant because they can kill the largest of ungulates and supplement their diet with a variety of smaller animals, such as snowshoe hares (*Lepus americanus*) and beavers (*Castor canadensis*). Wolves most often kill very young ungulates and very old ungulates because they are the most inexperienced and debilitated, respectively, in the population, and thus the easiest to capture. Still, wolves commonly kill healthy adult ungulates whenever conditions permit. Under unusual circumstances, such as extremely deep snow late in the winter, wolves may kill many more ungulates than they can eat, but usually wolves must constantly hunt to sustain themselves.

Social organization -- As in other areas of the northern hemisphere where they occur, most wolves in Minnesota live in family groups called packs. These packs are composed of a breeding pair and their offspring of one or more years, and sometimes one or more nonrelated wolves. A pair of wolves can be considered a pack, and some packs

number 15 or more. Throughout their lifetimes, wolves may also live on their own for some time, especially when they disperse from their natal pack and look for their own area in which to settle. At any one time, the proportion of the wolf population that is “alone” averages 10-15 percent, varying with the time of year and other factors.

Territoriality -- Wolf packs in Minnesota and elsewhere live in territories that are home ranges defended constantly against intrusion by other packs. On a rangewide basis, territories comprise a mosaic of wolf packs with few uninhabited areas in between. Territories may be as small as 25 square miles or as large as 200 square miles, depending on pack size and the density of ungulates (i.e., amount of food available). Boundaries of territories sometimes are obvious topographical features such as lakes or rivers, but most often they are indiscernible to humans. Boundaries usually are quite stable from year to year, except when pack composition changes substantially.

Dispersal and reproduction -- Wolves usually leave their packs when they are yearlings to seek a mate and establish their own territory and pack. This dispersal often occurs during autumn and, if successful in pairing, results in breeding in February and pups born in April. In most packs, only one female gives birth and litter sizes usually range from 4 to 7 pups. All pack members contribute to raising pups during the summer, whether the pups are at dens or at resting areas called “rendezvous sites.” By autumn, pups have grown to nearly adult size and begin traveling with other pack members.

Survival -- Unless food is very abundant, up to one-half of wolf pups die before they reach 6 months of age. Starvation is thought to be the major cause of death of pups, but diseases that particularly affect pups also are important. Mortality of adults also is relatively high. In a wolf population that remains at the same level from one year to the next, about 35 percent of adult wolves die each year. The most common natural causes of mortality to both pups and adults are starvation and intraspecific strife (i.e., wolves killing other wolves). This happens when food is scarce and when wolves must “trespass” into adjacent wolves’ territories to hunt. Resident wolves defend their territory and food supply, and often the result is the death of one or more members of both packs. Infrequently, disease may also be an important adult wolf mortality factor. Wolf survival in Minnesota is not affected by competition with black bears (*Ursus americanus*) or coyotes. Infrequently, motor vehicles or trains accidentally hit and kill wolves. Wolves

are also deliberately (illegally) killed by humans, but the frequency of these illegal actions is unknown. In addition, about 150 wolves are killed each year by depredation control activities.

Density -- A review of many wolf studies in North America indicates that wolf abundance is directly related to prey abundance. When prey is relatively abundant, litter sizes are larger and pup survival is greater. Under the best circumstances, wolf populations can increase 30-40 percent per year. Conversely, when prey is scarce, litters are smaller and pup survival is lower. The result is a sort of balance between wolves and their food supply. However, the density of wolves is also influenced by mortality. High mortality rates, such as from disease or harvest by humans, might reduce wolf numbers even though prey is relatively abundant. Also, wolf numbers might be relatively low in areas of high prey abundance that wolves are just beginning to colonize, or relatively high in areas where ungulate density is declining due to some other factor, such as severe winter weather. These differences in actual versus expected density are the result of "time lags," or the time needed for wolf populations to adjust to the food supply. In any one year, the ratio of wolves to ungulates may vary, but over a period of years with relatively stable ungulate populations there is the strong likelihood of a predictable balance between wolf and prey abundance.

Interactions with humans

Values -- Wolves have always played a prominent role in Native American culture and spirituality. In general, wolves were revered by American Indians, who made no efforts to control wolf populations or eliminate them from the landscape. However, American Indians did kill some wolves, usually for fur and cultural reasons. Similarly, early European fur traders seemed indifferent to wolves because they neither posed a threat to their livelihood nor were considered valuable furbearers. Conversely, European immigrants definitely did not value wolves and already had a long history of persecuting them in their homelands. In Minnesota, the bounty system for wolves started in 1849 and continued through 1965. Settlers not only had a mostly unfounded fear of wolves, but knew that wolves killed livestock and competed with humans for wild ungulates. Culturally, wolves had little or no value to Europeans and were viewed as a species to be

eliminated. Over time, some economic value of wolf pelts accrued, but there were no widely accepted reasons to protect or conserve wolves in Minnesota prior to the 1960s.

Attitudes -- Public attitudes began to change significantly with the “environmental revolution” in the 1960s, and by 1966 the first federal ESA was passed. Subsequently, wolf research and protection efforts increased substantially, as did educational efforts on behalf of the wolf. Wolves remained a species to be eliminated in the eyes of some, but gradually more people became concerned about wolves and their long-term survival in Minnesota.

Legal and conservation status

State -- Wolves were unprotected in Minnesota prior to the federal ESA and could be taken by public hunting and trapping. In addition to the state bounty, Minnesota had for a number of years an ongoing government wolf control program, including aerial shooting, which ended in 1956. The last bounties on wolves were paid in 1965. From 1965 through 1973, some wolves were killed for fur, while depredating wolves were killed from 1969 through 1973 under a state directed predator control program. In 1974 all wolves were protected from any harm or death by being listed as a federally endangered species. Wolves were listed by Minnesota as a threatened species in 1984, and removed from the state list in 1996. In 1978, Minnesota created a compensation program administered by the Minnesota Department of Agriculture (MND) to pay livestock owners for wolf caused losses.

Federal -- The federal Endangered Species Preservation Act of 1966 provided wolves limited protection, but only on federal lands. In 1970 the Superior National Forest was closed by supervisory decree to the taking of wolves. In 1974 the federal ESA of 1973 legally protected all wolves in the lower 48 states as an endangered species. Beginning in 1975, wolves depredating on livestock were captured and relocated elsewhere in extreme northern Minnesota by USFWS trappers. In 1978 an Eastern Timber Wolf Recovery Plan was published that called for wolf management zones, the re-establishment of wolves elsewhere, and reclassification of wolves in Minnesota. Wolves in Minnesota were federally reclassified as threatened in 1978, thus allowing government trappers to kill depredating wolves under a set of strict guidelines. In 1986 authority for federal wolf

control efforts passed from USFWS to USDA Animal Damage Control (now Wildlife Services). Under federal law, disposal of gray wolf parts and hides is by federal permit.

Tribal -- American Indian tribes in Minnesota are sovereign governments that by various treaties retain certain rights to regulate natural resources used by their members on tribal and public lands on reservations, and in some cases, on public lands in ceded territories. Tribal governments also have the authority to dispose of gray wolf parts and hides as they see fit, including use for religious and ceremonial purposes.

Recovery criteria -- In 1992 a revised federal recovery plan (1992 Recovery Plan) identified specific criteria for delisting wolves in Minnesota and adjacent states. These included a Minnesota wolf population goal of 1,251-1,400 by the year 2000, a combined Wisconsin-Michigan population of greater than 100 for 5 consecutive years, and management programs in each state that would ensure the continued survival of wolves in the future.

Density and Distribution

Through the 1970s -- Wolf distribution and abundance has changed significantly in Minnesota over the past 150 years, as a consequence of changes in the human population composition, public attitudes, and legal status afforded wolves. Wolves once occurred throughout the state, but by 1900 wolves were rare in southern and western Minnesota. Wolf range continued to decrease, and by the 1940s the highest densities remained in remote areas of the northern third of the state, adjacent to and contiguous with the much larger wolf population in Canada. During the early 1950s, wolves still occurred almost exclusively in 12,000 square miles of the northern and northeastern part of the state and numbered 450-700. By the mid-1960s wolves might have numbered 350-700, and by 1970 numbers were estimated at 750 and their range probably covered almost 15,000 square miles. As a result of federal and state protection and increasing deer numbers, wolves numbered 1,000-1,250 by the late 1970s, and had increased at an average annual rate of about 5 percent per year.

1988-89 -- During the winter of 1988-89, the state conducted a comprehensive assessment of wolf distribution and abundance. Federal, state, and county natural resources professionals, all familiar with wolves and wolf sign, were asked to record winter wolf observations. This information (1,244 observations) was combined with other

distribution data, such as location of wolf depredation activities and radioed research packs, to estimate total occupied wolf range in the state (20,500 square miles), which indicated a range expanding south and west. The resulting population estimate of 1,500-1,750 wolves was well above the federal recovery plan goal. Overall, wolf numbers had continued to increase at a rate of about 3 percent per year, and wolf range had also increased.

1990s -- During the 1990s, sightings, reports, DNR annual scent station surveys, and federal depredation trapping activities all indicated that wolves were continuing to expand their distribution and thus their abundance. Given these observations and assuming that the continuing rate of wolf population increase was similar to that observed during the 1970s and 1980s, DNR estimated that there could have been 2,000-2,200 wolves in Minnesota in 1994. During winter 1997-98, an effort similar to but expanded from the 1988-89 survey was made to document wolf distribution and estimate total numbers. From more than 3,300 observations, DNR estimated that in winter 1997-98, 2,445 wolves ranged over approximately 33,970 square miles in Minnesota.

Wisconsin and Michigan -- In Wisconsin and the Upper Peninsula of Michigan the wolf population has also expanded, but at an even faster rate because of abundant prey and few wolves. In the early 1970s, there were no more than six wolves in Michigan, and one pack in Wisconsin. By 1994 wolves numbered 57 in each state, and by 1997 Wisconsin had 148 wolves (37% increase/year) and the Upper Peninsula of Michigan had 112 (25% increase/year). By 1998, both states had prepared draft wolf management plans.

Management activities

Monitoring -- Comprehensive monitoring of wolf numbers and distribution in Minnesota has been carried out by DNR at approximately 10-year intervals, and other population surveys and depredation trapping have provided annual population trends. In addition, state and federally funded research projects that estimate wolf population trends and dynamics on specific study areas have been conducted for 2-30 year periods for the past 30 years. These studies, all of which include monitoring of numerous radio collared individuals, have occurred in all portions of wolf range in Minnesota, and continue today. DNR also carries out annual evaluations of deer and moose populations. Ungulates are managed on a regional basis to ensure sustainable harvests for hunters, sufficient numbers

for aesthetic and nonconsumptive use, and minimal damage to natural communities and conflicts with humans such as depredation of agricultural crops.

Depredation control -- Since 1986, control of depredating wolves has been the responsibility of the USDA Wildlife Services wolf depredation program headquartered in Grand Rapids. During 1993-1997, that program was responsible for investigating 159-209 complaints annually, and killing an average of 158 wolves each year, many of which were utilized for scientific and educational purposes. The annual budget for the federal depredation program is approximately \$250,000 per year.

Compensation payments -- Assessment of livestock losses and eligibility for payment of compensation is a cooperative effort between USDA Wildlife Services, DNR Division of Enforcement, MNDA, and county extension agents. Compensation payments made by the MNDA ranged from \$31,000 to \$46,000 each year during 1993-1997.

Enforcement -- Because wolves are protected under federal, state, and tribal law, enforcement of statutes prohibiting the illegal killing or harassment of wolves is the responsibility of the enforcement staff of USFWS, DNR, and tribal natural resource departments.

FUTURE WOLF MANAGEMENT IN MINNESOTA

The goal of this management plan is to ensure the long-term survival of wolves in Minnesota while also adequately addressing the wolf-human conflicts that inevitably result when wolves and people live in the same vicinity. To achieve this goal DNR, in cooperation with MNDA and USDA Wildlife Services, proposes to keep in place some current wolf management activities, and to enhance or add others. In particular, the plan addresses wolf conservation concerns in the areas of population monitoring and management, depredation management, habitat management, law enforcement, public information and education, research, and program administration.

Authority

Many aspects of this plan are superseded by federal laws, until the wolf is delisted from the ESA. When delisting occurs, all federally superseded state laws existing at that time will be immediately effective, and all federal wolf regulations eliminated. However, after delisting USFWS will continue to monitor the status of wolves in Minnesota for a

period of 5 years to ensure that recovery goals are maintained. Should Minnesota or any state manage wolves in a manner that results in population declines below the 1992 Recovery Plan goals, USFWS has authority to immediately re-list the species. The 1992 Recovery Plan also requires USFWS to determine that the survival of the wolf in Minnesota is assured, before making a delisting decision. For these reasons, it is desirable for Minnesota to have a legislatively authorized wolf management plan prior to federal delisting.

DNR authority to manage wolves is governed by the Minnesota Legislature through statutes. For some aspects of wolf management, existing statutes provide authority for DNR management actions and activities. However, additional authorities are needed now, and in the future, to fully implement the Roundtable recommendations and this wolf management plan. A policy bill for the 1999 Minnesota Legislature (Appendix II) will clarify existing wolf management authorities, provide new authorities, and authorize this management plan. This bill is needed to facilitate the USFWS federal delisting process, and also to ensure that essential management authorities are in place for immediate implementation when federal delisting occurs. A proposed future bill (Appendix III) includes additional policy provisions (with fiscal impacts), to be considered by the Minnesota Legislature when federal delisting is imminent. The fiscal impacts of this bill would require new appropriations (see Appendix IV), to fund the implementation of Minnesota's wolf management program.

Population monitoring

Assessment of wolf numbers and distribution -- DNR will continue and enhance current methodologies to periodically assess wolf population abundance and distribution. As with any survey of wild animals in their natural environment, the results of these assessments are estimates, which may be somewhat higher or lower than the actual population. DNR used the current methodology to conduct comprehensive statewide assessments of wolf distribution and numbers in winters 1978-79, 1988-89 and 1997-98. For future wolf population and distribution assessments, these methodologies will move as close as possible toward an actual census; that is, a total enumeration or count of wolves in Minnesota. Methodology enhancements will include: 1) standardized training of the data collectors and objective verification of their data, and 2) more continuous tracking and

verification of information from more radiocollared control groups. In the past, these statewide population assessments have been conducted approximately every 10 years. The next comprehensive statewide estimate of wolf distribution and numbers will be scheduled 5 years after federal delisting, and implementation of this plan.

Annual indices -- Annual changes in wolf distribution and abundance will be monitored by means of currently used indicators such as wolf depredation complaints, autumn scent station surveys, winter furbearer track surveys, and other observations of field personnel from all natural resources agencies. Such trend indicators likely will not identify small population changes or changes in specific areas, but an accumulation of evidence from multiple sources and/or multiple years might provide indications of overall wolf population trends.

Radio-telemetry -- Continuing area-specific telemetry monitoring of wolves will be encouraged. Emphasis will be placed on areas of wolf population concern, such as newly colonized regions and areas where conflicts with humans are likely. Such monitoring might be carried out directly by DNR, but also by other agencies or university scientists. The use of technological advancements such as satellite telemetry will be encouraged. Permits to conduct such research are authorized by DNR and as such have specific reporting criteria to ensure that the monitoring is helping to fulfill wolf management and conservation objectives.

Health -- Monitoring the health of wolves necessarily includes consideration of the effects of infectious diseases and parasites. Examples of health monitoring include collection and analysis of biological samples from live-captured wolves, analysis of wolf scats, and necropsies of dead wolves. Regular collection of pertinent tissues of live-captured or dead wolves will be initiated, and periodic assessments of wolf health will be carried out under authorization of DNR, especially when circumstances indicate that diseases or parasites may be adversely affecting portions of the wolf population.

Population management

Population goal -- Wolves in Minnesota will continue to be allowed to naturally expand their range in the state. To assure the continued survival of the wolf in Minnesota, the minimum statewide winter population goal is 1,600 wolves. There is no maximum goal. If the population falls under this recommended minimum, DNR will take appropriate

management actions to address the cause of the reduction and assure recovery to the minimum level in the shortest possible time.

Distribution -- Though the 1992 Recovery Plan identified specific wolf management zones with differing population goals within Minnesota, no such zones are identified here. No general public taking of wolves is recommended by this plan within the next 5 years (see **Population management activities** below), and killing of depredating wolves is recommended to continue to be allowed only at the site of depredations (see **Depredation management** below). Thus, wolves will continue to be protected on all public lands, but can be removed from private land (and in some cases, small areas of immediately adjacent public land). Because of the way in which public and private lands are distributed in Minnesota, a natural system of “zones” will continue to develop, as it has in the past. Where wolves are not in conflict with humans, they will be left alone; where they are in conflict with humans, problem wolves will be removed.

Population management activities -- Population management measures, including regular public taking or other options, will be considered by DNR in the future but not sooner than the 5-year post-delisting monitoring period by USFWS. If, in the future, public taking is authorized by the legislature, there will be opportunity for full public comment. Decisions on public taking will be based on sound biological data, including comprehensive population surveys and the results of depredation prevention and nonlethal control research.

Public Safety

No documented cases of wolves attacking and injuring people have occurred in Minnesota. Nevertheless, many people are sincerely concerned about the threat of wolves to human safety, citing recent documented attacks of wolves on people in Ontario, Canada, and in India, and observations in Minnesota of bolder behavior of wolves around human habitations since full protection was provided by ESA. In consideration of these safety concerns, DNR is recommending Statute changes to allow a person, at any time, to take a gray wolf in defense of the person's own life or the lives of others (Appendix II.). A person who takes a gray wolf in defense of human life must protect all evidence, and report the taking to a DNR Conservation Officer within 24 hours.

Depredation management

Administration -- DNR will assume administrative responsibility for an integrated wolf depredation management program. Subject to availability of state and federal funding, in addition to DNR Conservation Officers and County Extension Agents, DNR and/or MNDA may certify other agents (e.g., state, federal, and tribal employees) to carry out depredation management activities. DNR will contract for needed assistance with the USDA Wildlife Services program.

Approach -- DNR will use an integrated wildlife damage management approach to reduce animal losses to wolves, similar to that currently used by the USDA Wildlife Services wolf depredation program. This approach combines animal husbandry considerations, repellants and frightening devices, guard animals, killing problem wolves, and compensation payments to farmers. At farms where damage has been verified, depredating wolves will be killed by certified agents. The definition of depredation includes the killing of livestock by wolves, the killing of dogs that are under the supervised control of the owner, and the killing of livestock guard animals (including llamas, donkeys, and dogs).

New activities -- To increase the efficiency of the depredation management program, additional activities will be proposed. First, a handbook for wolf depredation investigations should be produced and all certified agents trained in its use. Second, a uniform evidence-reporting system should be developed, including photo-documentation of the depredation site. Third, a central public telephone contact (a toll-free number) should

be established to simplify loss reporting. Finally, a database of all reported losses of eligible animals to wolves, not just verified losses, should be developed; the database should also include information about losses to predator species other than wolves.

Best Management Practices -- BMPs are livestock husbandry and management practices that can result in the reduction and prevention of livestock depredation by wolves and other predators. A handbook of recommended BMPs should be developed and distributed to livestock owners. The use of these BMPs by livestock owners should be encouraged.

Nonlethal control by animal owners -- To help prevent depredation by wolves, DNR proposes legislation that allows a livestock or dog owner to, at any time, harass any wolf within 500 yards of people, buildings, dogs, livestock, or other domestic animals in a noninjurious, opportunistic manner. However, wolves may not be purposely attracted, tracked, searched-out, and then harassed. Wolves showing abnormal behavior should be reported to a DNR Conservation Officer.

Lethal control by animal owners -- DNR proposes legislation that allows owners (or their agents) of livestock, livestock guard animals, and dogs to take action to destroy wolves that pose an “immediate threat” to livestock, guard animals, or dogs. An immediate threat is when a wolf is observed in the act of pursuing or attacking. The mere presence of a wolf, or a wolf feeding on an already dead animal does not constitute an immediate threat. For livestock and guard animals, this action would be permitted only on property owned, leased, or occupied by the owner. In the case of dogs, this action would be permitted only for dogs under controlled supervision of the owner. When animal owners take action to kill a wolf, the following conditions would apply:

1. A livestock, livestock guard animal, or dog owner will report the action to a DNR Conservation Officer with 24 hours and protect all evidence associated with the action.
2. DNR will investigate all reported killing of wolves and will:
 - a. keep written and photographic documentation of the kill site including any instances of poor husbandry that may have contributed to the attack occurring.

- b. with livestock owners evaluate what, if any, BMP and nonlethal controls are needed to prevent future attacks, and develop with the owner a reasonable written and signed plan for implementation.
 - c. confiscate the wolf remains.
- 3. Agents will report any evidence of abuse of these conditions.
- 4. Legislation to be proposed at the time of federal delisting will further provide that failure to comply with the elements of this program, including failure to implement in a reasonable length of time the BMP/nonlethal control plan developed with the authorized agent, will result in loss of a livestock or dog owner's eligibility for future wolf damage compensation for a period of 1 year.
- 5. Salvageable wolf remains will remain in the control of the state or tribal authorities and may be disposed of only by donation or sale for educational purposes.
- 6. The application of this provision to allow animal owners to kill wolves will be reviewed annually (see **Plan monitoring and review** page 32) regarding the continuation, modification, or termination of this provision.
- 7. Monthly reports of activities under this provision will be made available to the public.

Depredation verification -- Verification of wolf depredation claims will continue to require an inspection of the depredation site by a certified agent. A finding that depredation by wolves has occurred shall be based upon physical and circumstantial evidence, including the presence and condition of remains of the carcass of an eligible animal; wolf tracks; the number and location of bites on the carcass and the method of killing; where the loss occurred; sightings of wolves in the area; and any other circumstances determined to be pertinent by the investigating agent. The certified agent will use the depredation handbook for wolf depredation investigations, complete the uniform evidence-reporting form, take photographs of the kill site, and record all reported losses of eligible animals (not just verified losses to wolves) in the database.

Lethal control by state agents -- If there are physical remains of wolf-killed livestock, livestock guard animals, or dogs, lethal control of wolves will be carried out by state certified contract trappers. If no physical remains are present but there is a compelling preponderance of evidence, or an accumulation of compelling evidence of

killing by wolves over time, then lethal control will also be carried out. Trapping or snaring will be authorized up to one mile from the site of the depredation on private and public land. Control activities will not exceed 30 days, unless additional verified wolf depredation occurs. Salvageable wolf remains obtained during depredation trapping will be retained by the state and disposition will be only for education purposes.

Compensation criteria -- When wolf depredation is verified by an investigating agent, compensation will be authorized. The current compensation program for wolf depredation on livestock will be continued, and DNR will propose compensation for the loss of livestock guard animals and dogs under the supervised control of the owner. Veterinary costs incurred as a result of wolf depredation will also be proposed to be a compensated loss.

When livestock, livestock guard animal, or dog owners experience losses and apply for compensation, the following conditions apply:

1. A livestock, livestock guard animal, or dog owner will report the depredation claim to an authorized agent, and protect all associated evidence.
2. For claims involving livestock or livestock guard animals, the investigating agent will record any deficiencies in the owner's adoption of BMPs developed by MNDA.
3. The MNDA Commissioner shall evaluate the record for conformance with BMPs, and provide the owner with a list of any BMP deficiencies.

Amount of compensation -- The amount of compensation paid to owners of livestock currently is capped by Minnesota Statutes at \$750, but compensation closer to fair market value should be considered by the Minnesota Legislature. Compensation for the loss of guard animals (animals specifically bred, trained, and used to protect livestock from wolf depredation) should be the same as for livestock. Compensation for dogs not qualifying as guard animals, but under the supervised control of the owner, should be fair market value not to exceed \$500.

Depredation research -- The Minnesota Legislature should appropriate \$500,000 to be granted on a 1:1 matching basis to nonstate funding sources for ongoing research, development, and dissemination of BMPs and nonlethal means of wolf control to abate wolf depredation to livestock, livestock guard animals, and dogs. Farms actually

experiencing depredation by wolves should receive priority as research sites. The BMP research grant program should be developed and administered by MNDA, in consultation with DNR. To allow longer-term projects and to maximize the availability of funds over time, the \$500,000 should be achieved by annual appropriations of \$100,000 for 5 years.

Habitat management

Good wolf habitat includes areas where ungulate prey is abundant, where human-related sources of mortality are low, and that are sufficiently large and connected to maintain existing populations and ensure the continued exchange of dispersing unrelated wolves. Vegetation cover is significant only as it relates to these other factors because wolves are habitat generalists. DNR will continue to identify and manage currently occupied and potential wolf habitat areas to benefit wolves and their prey on public and private land, in cooperation with landowners and other management agencies.

Prey -- In Minnesota, white-tailed deer are the primary prey for most wolves, though in some areas with few deer (e.g., the far northeastern part of the state), moose are the main prey. Population and habitat management of deer and moose is primarily the responsibility of the DNR Section of Wildlife. DNR will continue to maintain healthy populations of these species by regulating deer and moose harvest by hunters, estimating population numbers and reproductive success, monitoring and improving deer and moose habitat, and enforcing laws. Deer and moose populations will continue to be managed in hunting management units that are based on habitat and environmental factors, land ownership and use, and human attitudes. Deer and moose population goals are designed to balance a variety of factors, including compatibility with habitats and ecosystems, sustainable harvests for hunters, deer observation and watching opportunities (aesthetics), and conflicts with humans such as vehicle accidents and crop depredation. Populations that provide sustainable harvests for hunters must be large enough to withstand natural mortality sources and still provide a harvestable surplus. Because wolf predation is one of several forms of natural mortality, any population capable of sustaining a hunting harvest will, by definition, also provide a healthy prey base for wolves. Area-specific ungulate populations are assessed through models that incorporate all known factors influencing population dynamics. Ungulate populations are managed by regulating hunting harvests and managing habitats.

Potential disturbance at den and rendezvous sites -- Both the Wisconsin and Michigan wolf management plans recommend seasonally protecting, from timber harvesting and road or trail construction, a zone within 110-880 yards for wolf dens and rendezvous sites, depending on the regularity of use of the den and the wolf management zone in which it occurs. The Superior and Chippewa national forests in Minnesota have similar recommendations. In Wisconsin and Michigan, such protection is deemed warranted because of the small size (compared to Minnesota) and recovering nature of the wolf populations in those two states, and because of the unknown but potential effects of human disturbance on pup survival. However, Minnesota's much larger wolf population is not vulnerable to the minor losses these disturbances might cause. In addition, wolves with pups in Minnesota and Wisconsin have been tolerant of nearby logging operations, moss harvesting work, military maneuvers, and road construction work.

Subpopulation connectivity -- Areas need to be of sufficient size to support a minimum of one to several wolf packs if they are to be identified as viable wolf habitat. However, for wolves to persist in these small areas for any length of time, they must be able to periodically "exchange" wolves with other subpopulations. In Minnesota, most of the occupied wolf range is contiguous; that is, most packs occur adjacent to or very near other packs. In addition, all wolves in Minnesota are connected with the much larger population inhabiting southern Canada. However, wolf habitat in Wisconsin is more fragmented, and somewhat isolated from the contiguous source population in Minnesota. The original source of Wisconsin's wolves was undoubtedly Minnesota, and continued exchange of wolves between the two states is desirable. Currently, no barriers to wolf dispersal exist between Minnesota and Wisconsin, but development of areas along the common border (such as urban sprawl) may impede future wolf movements. In cooperation with the Wisconsin Department of Natural Resources, DNR assessments of the effects of future development will be incorporated into long-term viability analyses of wolf populations in the interstate area.

Human-caused mortality

Wolf mortality due to human causes can be a major factor in either reducing wolf numbers or limiting population growth. Some of this mortality is accidental, such as

collisions with vehicles or trains. Other human-caused mortality is purposeful, either legal (wolf depredation trapping) or illegal (intentional shooting or trapping).

Accidental mortality -- Accidental mortality is not expected to significantly affect wolf population dynamics in Minnesota. Other than continued monitoring, efforts to reduce accidental mortality are unnecessary.

Illegal mortality -- Illegal wolf mortality results from a combination of opportunity and intent to violate the law. As evidenced by substantial wolf range expansion and population increases, illegal human-caused mortality has not constrained Minnesota wolves at the population level. However, illegal wolf mortality has the potential to impact local wolf numbers, especially where wolves are living in areas of high road density and human populations, where there is more human contact with wolves. A combination of education efforts, regulations, and enforcement will be used to reduce illegal wolf mortality. First, reducing animosity toward wolves might be helped by continuing to educate citizens about the effects of wolves on livestock, ungulates, and human activities. Education programs and information distribution will be encouraged and supported by DNR. Second, the opportunity to kill wolves may be reduced by restricting road and trail access to state forests and other lands. Motorized access into wolf habitat, and the level of human use of such access, has been shown to be a key factor in establishing and maintaining wolf populations. In the recent past, wolf packs rarely lived in territories where road densities were greater than about one mile of road per square mile of land. At such densities, it appeared that illegal killing of wolves exceeded a level at which wolf populations could sustain themselves. During winter 1988-89, it appeared that most wolf packs in Minnesota were located in areas with road densities less than 1.1 miles of roads per square mile of land, and human population densities less than 10 people per square mile; and in areas with road densities less than 0.8 miles of road per square mile of land, and human population densities less than 21 people per square mile of land. The most recent analysis (the 1997-98 state wolf distribution survey) indicates that most wolves still live in such areas, but also that many more wolves are living in areas with much higher road and human densities. As more tolerant attitudes toward wolves increase and depredations by wolves are controlled, wolves can be expected to continue to expand their range into areas with more roads and human access. Given the current status of wolves, reducing current levels of road access is

not necessary to increase either wolf density or distribution. However, in areas of sufficient size to sustain one or more wolf packs, land managers should be cautious about adding new road access that could exceed a density of one mile of road per square mile of land, without carefully evaluating the potential effect on wolves. Finally, increases in DNR enforcement time and activities related to wolves will enhance the enforcement of regulations protecting wolves and decrease illegal human-caused wolf mortality.

Legal mortality -- USDA Wildlife Services has killed about 150 wolves annually, in recent years, in verified depredation situations. The number of wolves killed annually by depredation control is likely to increase, as wolves continue to expand their range into transitional forest-agriculture landscapes. However, the number of wolves legally killed in depredation situations has not prevented wolf range expansion and population increases, because this mortality has been less than 10 percent of the wolf population. Wolves have tremendous reproductive potential, and can withstand human caused mortality rates of 28-53 percent annually, and still maintain growing populations. The removal of depredating wolves will not be limited by population management objectives, unless the total number of wolves killed annually rises to a level that causes a statewide population decline.

Law enforcement

Administration and funding -- Legal protection has been a key to increasing wolf numbers and distribution in Minnesota. Due to a continuing increase in the workload of DNR Conservation Officers, and their assumption of primary responsibility for wolf regulations enforcement after delisting, increases in staff and resources will be needed. The Minnesota Legislature will be asked to provide the budget resources necessary for proper enforcement of wolf laws, regulations, and programs. Additional tribal conservation officers should be cross-deputized to increase law enforcement capabilities concerning wolves. Cooperation with federal law enforcement officials will continue.

Penalties, permits, and prohibitions -- Proposed enforcement and penalties for the illegal taking (pursuing, shooting, killing, capturing, trapping, snaring, including attempting to take, and assisting another person in taking) of wolves will be consistent with present statutes on the illegal taking of other game and nongame species. Restitution value will be established at \$2,000.

Captive wolves and wolf-dog hybrids -- Wolves may be kept in captivity, provided they are legally obtained from licensed game farms or other authorized sources. In other situations where DNR permits are required, no permits will be issued for the purpose of keeping wolves as pets. The Minnesota Legislature should consider appropriate additional regulations regarding captive wolves, and wolf-dog hybrids, based on public safety concerns. The Legislature will be asked to prohibit the release of captive wolves and wolf-dog hybrids.

Public education and attitudes

The dissemination of factual information about wolves, their interactions with their environment, and their interactions with humans is a key component of successful wolf conservation. Such education efforts have been undertaken in Minnesota by a variety of private organizations and individuals, as well as state and federal agencies. The degree to which this information is useful and worthwhile depends on its presentation, accuracy, and relevancy.

Program and material development -- The major goal of DNR wolf education efforts will be to assure that timely and accurate information about wolves and wolf management is available to the public. Current information on the history of the wolf and its management in Minnesota, wolf behavior and biology, the wolf as part of the ecosystem, wolf status, human-wolf coexistence, and strategies for dealing with problem wolves will be available to all Minnesotans, in multiple formats.

Collaboration with other organizations -- Many private, nonprofit organizations currently provide educational programs and materials about wolves. Foremost is the International Wolf Center, at Ely, MN (IWC), which is focused exclusively on wolf education. Rather than “reinventing the wheel,” DNR will collaborate and cooperate with IWC and other organizations to achieve its wolf education goals. Collaboration will include providing data, reports, news releases, and other information for distribution by other organizations, and/or incorporation into their educational programming. Collaboration may also include financial and other resource sharing and partnerships.

Public and media relations -- DNR staff will provide access to and information about wolf management by meeting with the public, compiling reports, collecting data, issuing news releases, and preparing information packages for the public and the media.

Ecotourism -- Ecotourism is a recent and expanding additional use of natural resources in Minnesota. Its intent is to derive (for the private sector) financial benefits as the public enjoys and learns about large, healthy natural ecosystems with diverse wildlife populations. Wolves in Minnesota are a keystone ecotourism species, drawing tourists from around the world who come to view wolf tracks, scats, and kill sites, and to hear wild wolves howl. There is no information or research data that increasing human-wolf interactions associated with ecotourism is detrimental to wolves. Consequently, responsible wolf ecotourism will be encouraged.

Assessment of public attitudes -- Statewide surveys of public knowledge of and attitudes toward wolves and wolf recovery are extremely useful to wolf recovery and conservation. Understanding changes in public attitudes toward wolves is important for continued wolf existence, and periodic surveys (every 5 years) to assess shifts in public attitude and knowledge will be encouraged. Accurate information on public attitudes will help to ensure that wolf management adequately addresses citizens' needs, in addition to wolf conservation needs.

Research

Wolf research is expensive, and DNR-funded wolf research efforts should be focused on the topics most pertinent to achieving the goals of this management plan. Despite the abundance of wolf research in Minnesota and elsewhere, there are still several important areas of research that should be addressed.

Population assessment -- Because population assessment is the foundation for monitoring the status of wolves and the effectiveness of management programs, it is one of the most important aspects of a wolf management and conservation program. Population assessment methods must continue to be based on the very best science and data available. The comprehensive statewide assessment of wolf distribution and density in Minnesota conducted in 1997-98 was state of the art, but in future assessments additional investigations will be conducted to verify the accuracy of reports of observers and to increase the actual counts of pack sizes. Repeat surveys by independent observers, including those collecting radio-telemetry data on wolves in various areas, will also be conducted. In addition to the comprehensive surveys, annual wolf population assessments based on annual population trend surveys will be conducted to ensure against any

catastrophic changes in wolf distribution and numbers that could occur in the intervals between comprehensive surveys. Additional annual indices will be investigated, to improve the accuracy of annual wolf population trend assessments.

Livestock interactions -- Continued research is needed for developing BMPs that will result in reduced wolf depredation to livestock, livestock guard animals, and dogs. Foremost is research on nonlethal means of wolf behavioral control to abate wolf depredation, including identification of the behaviors of depredating wolves and improvements in our ability to predict depredation losses. Farms experiencing depredation by wolves should be used as sites for such research. Significant progress can be made with proposed collaborative financing provided on a matching basis from the Minnesota Legislature and any nonpublic funding source.

Prey interactions -- More information is needed on the effects of wolf predation and severe weather on deer numbers. Although there has been significant research on this topic in Minnesota, predicting the long-term effects of winter weather and wolf predation on deer populations is difficult. Long-term monitoring of deer and wolf populations in various portions of Minnesota will be a DNR research priority, especially as it relates to the role that wolves may play in regulating deer at relatively low population densities.

Disease monitoring -- Standardized and comprehensive disease testing has not been part of Minnesota wolf management activities, although significant disease research has occurred in Minnesota and incidental records are maintained by DNR. Wolves in Minnesota have greatly increased their distribution and numbers in Minnesota during the past 20 years, despite numerous documentations of various diseases. Nevertheless, disease is a potentially important mortality factor affecting wolf populations. DNR does not intend to initiate wolf disease studies, but will collaborate with other investigators and continue monitoring disease incidence.

Program administration

Personnel -- The wolf management program in Minnesota should be under the immediate direction of a Wolf Specialist. DNR will propose this new position at the level of senior Natural Resource Specialist in the DNR Division of Fish and Wildlife, with duties focused exclusively on wolf management. This person will be responsible for administering wolf management, including coordinating management and monitoring

efforts within DNR; serving as liaison with USFWS, USDA Wildlife Services, MNDA, County Extension, and tribal authorities; coordinating data collection and information dissemination; and recommending research efforts that pertain to wolf conservation in Minnesota. In addition, DNR proposes that once federal delisting is accomplished and full implementation of this plan occurs, a Wolf Research Biologist position should be created. This position will directly conduct wolf population assessments, propose and conduct wolf research, and provide DNR with the necessary professional expertise to implement the wolf management plan. Finally, DNR proposes the addition of three Conservation Officers, to ensure that enforcement of various provisions of the wolf plan is adequate.

Funding -- State funding for implementing the management plan should come from sources other than the DNR Game and Fish Fund. Wolves are a public resource valued for many different reasons by Minnesota citizens, and thus the fiscal support for their management should come from the general public. The costs for wolf research and management have been substantial in the past, and will continue to be substantial in the future. DNR estimates the total annual cost to the state of Minnesota for full implementation of this plan, including depredation activities but not including MNDA staff costs, to be about \$845,000 (Appendix IV.).

Interagency cooperation -- Cooperation between governmental agencies is of the utmost importance for ensuring the continued survival and competent management of wolves in Minnesota. Various state, federal, county, and tribal landowners and authorities have been participating in wolf management activities, and this must continue in the future through partnerships. Legal obligations commit agencies and organizations to participate in wolf management, and cooperation will continue to be invited by DNR, including but not limited to annual review of wolf management plan implementation (see **Plan monitoring and review** below).

Volunteers -- In order to enhance management efforts, participation of volunteers and volunteer organizations will be sought to help produce and present general wolf education programs and provide matching funds for research and development of wolf conservation strategies. Private individuals, schools and colleges, conservation organizations, and other partners will help achieve wolf management goals in Minnesota.

Plan monitoring and review

In addition to regularly reported assessments of wolf management progress, DNR will convene a group, including all groups participating in the 1998 Roundtable, to review and comment on management plan implementation and progress. This review will occur annually for five years, following federal delisting of wolves and the initiation of state management. The group will be asked to assess the degree to which each part of the plan has been successfully implemented, the effects of implementation on changes in wolf population levels and distribution, and changes in wolf interactions with humans. A written summary of conclusions of the group's assessments and any recommendations will be submitted to the Commissioner of DNR after each annual meeting.

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APPENDIX I

WOLF MANAGEMENT ROUNDTABLE CONSENSUS RECOMMENDATIONS

Wolf Management Roundtable Consensus Recommendations

On August 28, 1998, the Minnesota wolf management roundtable reached consensus on the following package of wolf management recommendations:

Wolf Population Management

Wolves in Minnesota will be allowed to expand statewide. Population management measures, including public taking or other options, will be considered in the future but not sooner than the 5-year post-delisting monitoring period of the U.S. Fish and Wildlife Service. If public taking is authorized by the legislature, the Department of Natural Resources will prepare and publish a rule, with opportunity for full public comment. Decisions on public taking will be based on sound data, including but not limited to the "5-year census" and the results of nonlethal control research.

To assure continued survival of the wolf in Minnesota, the roundtable recommends a minimum statewide population of 1,600 animals. This number is not a maximum population goal. If the population falls under the recommended minimum, appropriate management actions will be taken to address the cause of the reduction and assure recovery to the minimum level in the shortest possible time.

*Implementation: DNR, by the Wolf Management Plan
Legislature, by the 1999 Bill*

Wolf Population Monitoring

The roundtable accepts the current methodologies that the Minnesota DNR is using to indicate wolf population abundance and distribution, with the understanding that any results are estimates which may be higher or lower than the actual population. The roundtable recommends that for future wolf management decisions, the methodologies should move as close as possible toward an actual census. The roundtable understands that this movement toward a census for now will include:

- a. standardized training of the data collectors and objective verification of their data
- b. more continuous tracking and verification of information from more radio-collared control groups.

Implementation: DNR, by the Wolf Management Plan

Wolf Depredation Management

Issue 1: Animals/Damages Covered by the Depredation Program

The roundtable supports the continuation of a compensation program for wolf depredation to livestock.

The roundtable recommends a compensation program for wolf depredation to dogs under the supervised control of the owner, and livestock guard animals including llamas, donkeys and, dogs.

The roundtable recommends that veterinary costs incurred as a result of wolf depredation be included as a compensated loss.

*Implementation: Legislature, by a future bill
DNR, by the Wolf Management Plan*

Issue 2: Eligibility and Verification for Compensation and Lethal Control

The roundtable endorses the language in MN Rule 1515.3500 for determining eligibility for compensation, with the following additional recommendations:

- a. In addition to Conservation Officers and county extension agents, other agents (State, Federal, Tribal) certified by the State should be included.
- b. A handbook for wolf depredation investigations should be produced and all certified agents trained.
- c. A uniform evidence-reporting form should be developed including photographs of the kill site for the file.
- d. A central public contact (1-800 number) should be established.
- e. A database of all reported losses, not just verified losses, should be developed. the database should include information on all predator losses.
- f. The statutory requirement for a carcass to be present should be eliminated.
- g. MN Rule 1515.3500 should be amended to be specific to wolves, and not endangered species.

If there are physical remains of a wolf-killed animal, lethal control may be carried out by a government agency.

Note: Consensus was not reached on the level of verification required to initiate government agency control actions if physical remains are not present.

*Implementation: Legislature, by a future Bill
DNR, by the Wolf Management Plan*

Issue 3: Best Management Practices

The roundtable supports current legislative efforts to encourage the use of Best Management Practices (BMPs). The roundtable believes that the use of BMPs is critical to the long-term survival of the wolf in Minnesota, and urges the Minnesota Legislature to appropriate \$500,000 on a matching basis with any non-public funding source for ongoing research, development, and dissemination of BMPs and nonlethal means of wolf control to abate wolf depredation to livestock. The roundtable suggests that farms experiencing livestock depredation be used as research sites.

*Implementation: Legislature, by a future Bill
DNR, by the Wolf Management Plan*

Issue 4: Preventative Depredation Measures

Owners of livestock, livestock guard animals, and dogs and/or their permitted agents may take action to destroy wolves that pose an “immediate threat” to human life, livestock, guard animals, or dogs. This action is permitted only on the livestock owner’s property. In the case of dogs, this action is permitted only for dogs under the controlled supervision of the owner. “Immediate threat” is defined as follows: the wolf is observed in the act of pursuing or attacking. The mere presence of a wolf or a wolf feeding on an already dead animal does not constitute an immediate threat.

At any time, a farmer or dog owner may first “harass” any wolf within 500 yards of people, buildings, dogs, livestock, or other domestic animals in a noninjurious, opportunistic manner. Wolves may not be purposely attracted, tracked, searched- out or chased and then harassed. Wolves showing abnormal behavior will be reported to an authorized agent for action.

The following conditions apply when taking action to destroy a wolf:

- a. A farmer or dog owner will report the action to an authorized agent within 24 hours and protect all evidence
- b. The agent will investigate all reported taking of wolves and will:

1. keep written and photographic documentation of the kill site and any instances of poor husbandry that contributed to the attack occurring
 2. with farmers but not dog owners, evaluate what, if any, best management practices and nonlethal controls are needed to prevent future attacks and develop a reasonable written and signed plan with the farmer for implementation
 3. confiscate the wolf carcass(es)
- c. State agents will report any evidence of abuse of this rule
 - d. Failure to comply with the elements of this program, including failure to implement in a reasonable length of time the BMPs and nonlethal control plan developed with the authorized agent, or abuse of the program will result in loss of a farmer or dog owner's eligibility for future wolf damage compensation for a period of one year or until they implement the best management practices/nonlethal control plan
 - e. Pelts will remain in the control of the state or tribal authorities and may be disposed of only by donation or sale for educational purposes
 - f. This program will be reviewed at the annual gathering of roundtable participants who will make recommendations regarding the continuation, modification, or termination of this program
 - g. Monthly reports of this program will be made available to the public.

Implementation: *Legislature, by the 1999 Bill*
 DNR, by the Wolf Management Plan
 Legislature, by a future Bill

Issue 5: Removal of Verified Depredating Wolves

The roundtable recommends that the Department of Natural Resources assume administrative responsibility for an integrated wolf depredation program funded from the general fund. The roundtable recommends that DNR contract for assistance with the USDA/Wildlife Services program. Investigation of a kill site and verification of a wolf kill will be conducted by a state agent (as defined in Issue 2, a). Trapping may be accomplished by state certified contract trappers. Wolf pelts will be retained by the state and disposition will be only for educational purposes.

Implementation: *DNR, by the Wolf Management Plan*

Issue 6: Amount of Compensation

The roundtable recommends that the legislature consider compensation closer to fair market value than the \$750 cap currently in law for verified wolf kills of livestock.

The roundtable recommends that compensation for the loss of guard animals (animals specifically bred, trained, and used to protect livestock from wolf depredation) be the same as for livestock.

The roundtable recommends that compensation for dogs not qualifying as guard animals, but under the supervised control of the owner, be at fair market value not to exceed \$500.

*Implementation: Legislature, by a future Bill
 DNR, by the Wolf Management Plan*

Habitat Management

DNR will identify currently occupied and potential wolf habitat areas with the objective of managing habitat to benefit wolves and their prey on public land and in cooperation with private, corporate, and tribal landowners. Elements of wolf habitat that need to be considered include but are not limited to:

- a. human access
- b. disturbance at den and rendezvous sites
- c. corridors and linkages.

Implementation: DNR, by the Wolf Management Plan

Enforcement

Enforcement and penalties for the illegal taking (killing, injuring, beating, harassing, stalking, baiting/poisoning and other activities having the likelihood of injury or attempt to do the same) of wolves should be consistent with present statutes on the illegal taking of game. Fine levels should reflect the unique nature of the wolf. The roundtable further recommends that the restitution value of the wolf be established at \$2,000. Injury to wolves caused by guard dogs used in the traditional manner is not considered illegal taking.

Due to the increased workload of conservation officers, the roundtable recognizes the need to substantially increase the number of conservation officers as well as the resources available to them. The roundtable urges the legislature to provide the general fund resources necessary for proper

enforcement. The roundtable urges cross-deputization of additional tribal conservation officers and continued cooperation with federal law enforcement officials.

Implementation: *Legislature, by the 1999 Bill*
 DNR, by the Wolf Management Plan
 Legislature, by a future Bill

Education

The management plan should include an education component, providing information about:

- a. the history of the wolf in Minnesota
- b. wolf management in Minnesota
- c. wolf behavior and biology
- d. the wolf as part of the ecosystem
- e. wolf status
- f. human-wolf coexistence
- g. contacts for additional information about the wolf
- h. strategies for dealing with wolves.

Implementation: *DNR, by the Wolf Management Plan*

Ecotourism

The roundtable recommends that DNR address ecotourism in the management plan.

Implementation: *DNR, by the Wolf Management Plan*

Wolf-dog Hybrids and Captive Wolves

- a. The release of wolf hybrids and captive wolves into the wild should be banned.
- b. The legislature should consider appropriate regulatory measures, based on public safety concerns.

*Implementation: Legislature, by the 1999 Bill
DNR, by the Wolf Management Plan
Legislature, by a future Bill*

Management Plan Monitoring

The Department of Natural Resources will convene a group, including all groups participating in the existing roundtable, on an annual basis to review and comment on management plan implementation.

Implementation: DNR, by the Wolf Management Plan

Funding for Plan Implementation

State funding for implementing the management plan should come from sources other than the game and fish fund.

*Implementation: Legislature, by a future Bill
DNR, by the Wolf Management Plan*

APPENDIX II

WOLF MANAGEMENT BILL 1999 MINNESOTA LEGISLATURE

APPENDIX III

FUTURE WOLF MANAGEMENT BILL

APPENDIX IV

WOLF MANAGEMENT PLAN BUDGET

WOLF MANAGEMENT PLAN BUDGET

Program/Activity	First fiscal year following federal delisting	Annual Ongoing Base
Department of Natural Resources		
Wildlife Staff (2 FTE):		
Wolf Specialist (1 FTE)	\$70,000	\$70,000
Wolf Research Biologist (1 FTE)	\$70,000	\$70,000
Support staff (0.5 FTE)	\$20,000	\$20,000
Population Monitoring:	\$100,000	\$100,000
Depredation:		
Wolf Control	\$200,000	\$200,000
Enforcement Staff (3 FTE):	\$300,000	\$210,000
Education/Public Participation:	\$25,000	\$25,000
Department of Agriculture		
Depredation:		
Compensation*	\$50,000*	\$50,000*
Best Management Practices:	\$100,000 (for 5 years)	\$100,000
Total Wolf Program Costs:	\$935,000	\$845,000

*In addition to the current base appropriation of about \$50,000